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NOTICE OF ALLOWANCE AND FEE(S) DUE

22850 7590 11/01/2010

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

HEIDEMANN, JASON E

ART UNIT

PAPER NUMBER

2624

DATE MAILED: 11/01/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/585,255

07/05/2006

Tetsujiro Kondo

291587US8PCT

6069

TITLE OF INVENTION: IMAGE PROCESSING DEVICE AND METHOD, RECORDING MEDIUM, AND PROGRAM FOR TRACKING A DESIRED POINT IN A MOVING IMAGE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$0	\$1510	\$1510	02/01/2011

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

22850 7590 11/01/2010

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

Certificate of Mailing or Transmission

Hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/585,255 07/05/2006 Tetsujiro Kondo 291587US8PCT 6069

TITLE OF INVENTION: IMAGE PROCESSING DEVICE AND METHOD, RECORDING MEDIUM, AND PROGRAM FOR TRACKING A DESIRED POINT IN A MOVING IMAGE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional NO \$1510 \$0 \$1510 \$1510 02/01/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
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HEIDEMANN, JASON E 2624 382-103000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,255	07/05/2006	Tetsujiro Kondo	291587US8PCT	6069
22850	7590	11/01/2010	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			HEIDEMANN, JASON E	
			ART UNIT	PAPER NUMBER
			2624	
DATE MAILED: 11/01/2010				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 855 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 855 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	10/585,255	KONDO ET AL.	
	Examiner	Art Unit	
	Jason Heidemann	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 09/02/2010.
2. ☒ The allowed claim(s) is/are 1-20,22-28,30-43,45 and 46.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>09/02/2010</u> 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. 7. <input type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____. |
|--|--|

/Sath V Perungavoor/
Primary Examiner, Art Unit 2624

DETAILED ACTION

1. Claims 1-20, 22-28, 30-43, and 45-46 are pending.
2. Claim 1 is to an "apparatus", and is statutory since it recites means plus language, requiring physical hardware as supported in the specification.
The claim is statutory.
3. Regarding Claim 43, the claim is in a method claim format and cannot (and would not) reasonably or realistically be carried out without the aid of particular programmed computer due to the computational complexity of the recited steps. Thus, the claim passes the machine-or-transformation test (*In re Bilski*) and is eligible for patent protection.
4. Claim 46 is drawn to a non-transitory computer readable recording medium, and given the broadest reasonable interpretation of the claim in light of the specification and Official Gazette Notice (1251 OG 212, made available February 23, 2010), concludes that the claim fall within a statutory category. Note: Claim 46 was modified in an Examiner's Amendment found in the previous Notice of Allowance on 05/25/2010.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after issue of the application. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the application from

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issue has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/02/2010 has been entered.

Information Disclosure Statement

Examiner has considered all references cited in the Information Disclosure Statement (IDS) filed on 09/02/2010.

Allowable Subject Matter

3. Claims 1-20, 22-28, 30-43, and 45-46 are allowed over the prior art of record. Examiner has reviewed the supplied references in the IDS, and Examiner has determined that the claims are allowable.

The following is an examiner's statement of reasons for allowance:

The following prior arts were found:

Sun et al. (US Patent 6,731,799) discloses an Object tracking and segmentation method for video frames using iterative pixel grouping. Where the object contours are derived by relaxing the edge constraints on contour changes from one frame to the next. The contour energy is minimized while also

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considering normalized background information and motion boundary information. The background and boundary information define the object boundary propagation from one frame to the next, relaxing the constants on contour topography.

Magarey (US PGPub 2003/0053661) outlines a video feature tracking method for digital video analysis, involves updating reference data with feature data when difference between reference data and feature data is larger than predetermined value Where the feature position in current frame is estimated based on the position in previous frame and the feature data is extracted from the current frame. The extracted feature data is compared with reference data and when the difference between feature and reference data is larger than a predetermined value, and then the reference data is updated with feature data.

Sawasaki et al. (U.S. 5,838,365) teaches a local region image tracker for continuous tracking, suitable for high speed tracking of several objects in a scene. The image tracker includes an image data bus which transfers input image data from an image pick-up (camera). Several correlation tracking processors are coupled to the bus in parallel. The processors carry out a tracking process independently with respect to a search image. The tracking process for several search images is carried out in a distributed manner by the processors.

Itokawa et al. (U.S. 7,024,040) discloses an image processing procedure involving connecting points between a background block and object block for

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forming closed curve from which outline of objective image is extracted. When significant activity is detected, block classification is performed to background, object and boundary blocks to detect their contact points which is set as initial stage and closed curve is termed by points sequentially from which outline objective image extracted.

Kondo et al (U.S. 2003/0156203) discloses an image processing device capable of determining a mixing ratio indicating the state in which a plurality of objects such as a background image and an image of a moving object are mixed. Kondo further teaches not only extracting the background pixel data but also data on a pixel of interest and its adjacent pixels. The method generates a plurality of relations among the pixel of interest, the adjacent pixel data, and the background pixel data. The method computes a mixing ratio indicating the mixed state of the objects in the real world with respect to the noted pixel by using this relation.

Watanabe et al. (JP 2002-369071) discloses a method for determining the quality of an image for use in an adaptive filter, where a metric for measuring an image's sharpness is used, the metric being a sum of absolute differences between a pixel under consideration (pixel of interest) and adjacent pixels to the pixel under consideration

Claim 1: An image processing apparatus (**Sun, Fig.1**) comprising:

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position estimating means (**Sun, Fig.2, EI 28**) for estimating the position of a second point representing a tracking point in an image of a temporally next unit of processing (**Sun, Column 7, Lines 49-53, Lines 59-66, Column 8, 32-35, estimates the position of an edge point(s) of an object using an auto-predicative search, to track the edge point(s) in the temporally next frame**), the second point corresponding to a first point representing the tracking point in an image of a temporally previous unit of processing (**Sun, Fig. 10A, Fig. 10B, Column 1, Lines 22-25, Column 8, Lines 29-33**);

generating means for generating estimated points serving as candidates of the first point when the position of the second point is inestimable (**Sun, Column 8, Lines 26-29, if a scene change is detected (a second point is inestimable) then the process is reinitialized (building new models and tracking new points)**);

determining means for determining the second point in the next unit of processing on the basis of the estimation result of the position estimating means when the position of the second point in the next unit of processing is estimable (**Sun, Column 7, Lines 49-53, Lines 59-66, Column 8, 32-35, if a scene change has not occurred (the second point is estimable) then the position of an edge point of an object is estimated using an auto-predicative search which tracks the edge point in the temporally next frame**); and

selecting means for selecting the first point from among the estimated points when the position of the second point is inestimable (**Sun, Column 8,**

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Lines 26-29, Column 7, Lines 38-46, if a scene change is detected (a second point is inestimable) then the process is reinitialized, where the user can select point(s) for tracking (selecting means) or the computer can perform a segmentation to generate the new edge point(s) to track (selecting means)), wherein

the determining means includes:

evaluation value computing means for computing an evaluation value representing a correlation between pixels of interest representing at least one pixel including the first point in the temporally previous unit of processing and the corresponding pixels representing at least one pixel in the temporally next unit of processing and defined on the basis of a motion vector of the pixels of interest (Margarey, Fig. 2A, Fig. 2B, [0008], Lines 1-12, [0009], Lines 1-12, [0081], Lines 104, [0088], Lines 1-7, and [0087], Lines 1-12, an evaluation means, Loss Of Target, (position is estimable or inestimable) is determined by comparing (correlation taught as a suitable method) the pixel between a reference data set (data from a previous frame) an the feature set (data extracted based on region around a position estimated by the motion vector)));

variable value computing means for computing a variable value representing the variation of a pixel value with respect to the pixels of interest (Margarey, [0008], Lines 1-5, [0087], Lines 1-12, a (variable)

value represents the difference (variation) between pixel values of the reference data set and the feature set (pixels of interest));

and accuracy computing means for computing the accuracy of the motion vector (**Margarey, [0008], Lines 1-5, [0087], Lines 1-12, the accuracy of the motion vector is determined using a threshold on the pixel differences between a reference data set an the feature set), this value represents accuracy (a difference of 0, would be exact match, a larger number would correspond to a poorer match), and if this accuracy value is under a predetermined threshold the accuracy of the new motion vector is not used, rather the pervious position is used**), and

the variable value computing means computes the variable value representing the sum of values (**Watanabe, Abstract, [0022] discloses a method for determining the quality of an image, based upon a sharpness measure using the sum of absolute differences between a pixel under consideration (pixel of interest) and adjacent pixels to the pixel under consideration**) obtained by dividing the sum of absolute differences between the pixels of interest and the adjacent pixels that are adjacent to the pixels of interest in a block including the pixels of interest by the number of the adjacent pixels.

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Applicant uniquely claimed a distinct feature in the instant invention, which are not found in the prior art, either singularly or in combination. The feature is “the variable value representing the sum of values is obtained by **dividing** the sum of absolute differences between the pixels of interest and the adjacent pixels that are adjacent to the pixels of interest in a block including the pixels of interest **by the number of the adjacent pixels**” these, in combination with the other respective claim limitations, that is the cited references do teach a variable or metric of dividing the sum of absolute difference (SAD) by the number of adjacent pixels, that is normalizing the SAD value by dividing by the number of adjacent pixels.

These features are not found or suggested in the prior art

Independent Claims 43 and 46 allowed for similar reasons as mentioned above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Heidemann whose telephone number is (571)-270-5173. The examiner can normally be reached on Monday -

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Thursday/7:30 A.M. to 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on 571-272-7778. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular communications and 571-273-8300 for After Final communications. TC 2600's customer service number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason Heidemann/
Examiner, Art Unit 2624

10/21/2010

/Sath V. Perungavoor/

Sath V. Perungavoor
Primary Examiner, Art Unit 2624

Art Unit: 2624

Dated: October 27, 2010